



## Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact [support@jstor.org](mailto:support@jstor.org).

This geometry will never replace the older geometries, but with further development many new theorems may be discovered. Any one interested in modern geometry will read the work with pleasure; and detecting the few slight errors will add a little zest.

F. A. FORAKER.

UNIVERSITY OF PITTSBURGH.

## PROBLEMS AND SOLUTIONS.

EDITED BY B. F. FINKEL AND R. P. BAKER.

### PROBLEMS FOR SOLUTION.

#### ALGEBRA.

##### 443 Proposed by A. M. KENYON, Purdue University.

If  $p_r$  denote the sum of all the different  $r$ -factor products that can be formed from the first  $n$  natural numbers ( $p_r = 0$  for  $r > n$ ), and if

$$D_s = \begin{vmatrix} p_1 & 1 & 0 & \cdots & 0 \\ 2p_2 & p_1 & 1 & \cdots & 0 \\ 3p_3 & p_2 & p_1 & \cdots & 0 \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ \cdot & \cdot & \cdot & \cdot & \cdot \\ sp_s & p_{s-1} & p_{s-2} & \cdots & p_1 \end{vmatrix}$$

show that

$$\sum_{i=0}^k (-1)^i c_i \binom{k}{i} D_{2k-i} = 0, \quad k, n = 1, 2, 3, \dots,$$

where  $c_i = \frac{2k+1-i}{1+i}$  when  $i$  is even and  $2n+1$  when  $i$  is odd; and  $\binom{k}{i}$  is the coefficient of  $x^i$  in  $(1+x)^k$ .

##### 444. Proposed by J. E. ROWE, Pennsylvania State College.

Prove that the determinant

$$\begin{vmatrix} \cot A & \cot B & \cot C \\ 1 & 1 & 1 \\ \cos^2 A & \cos^2 B & \cos^2 C \end{vmatrix} = 0,$$

where  $A$ ,  $B$ , and  $C$  are the angles of a plane triangle.

#### GEOMETRY.

##### 474. Proposed by LAENAS G. WELD, Pullman, Illinois.

Upon a fixed and constant base stands a system of co-planar triangles, for each of which the radius of the inscribed circle is to that of the circumscribed circle as  $1:2$ . What is the locus of the vertices opposite to the given fixed base?

##### 475. Proposed by ELMER SCHUYLER, Brooklyn, N. Y.

Given two circles and a straight line, to draw a circle tangent to the line and coaxial with the two given circles.